83-09-01
B-GL-318-008/PT-Z01
(Formerly A-PD-318-008/PT-Z01)

A Soldier must be able to USE A MAP...

...to form a true MENTAL PICTURE of the ground

Know the Conventional Signs - they are the Foundation

Coloured symbols are used to portray features on maps. Though fairly standard they could vary from map to map. Verify the legend.

ROADS

Hard surface, all weather . . . . . dual / divided

Hard surface, all weather . . . . . 2 or more lanes

Loose or stabilized surface, all weather . . . . . 2 or more lanes

Loose surface, all weather . . . . . less than 2 lanes

Loose surface, all weather . . . . . and unclassified streets

Cart track; trail . . . . . — — — — — — —

Highway interchange with number; traffic circle . . 42 Red

Highway route marker . . . . . 5 Orange or red

RAILWAYS


Multiple Track


Single Track

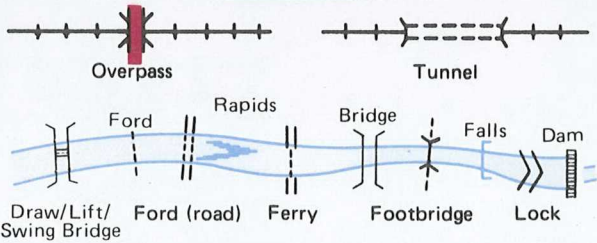

Abandoned


Narrow Gauge Track

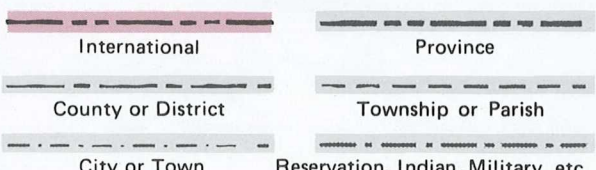

Station/Turn Table


Siding

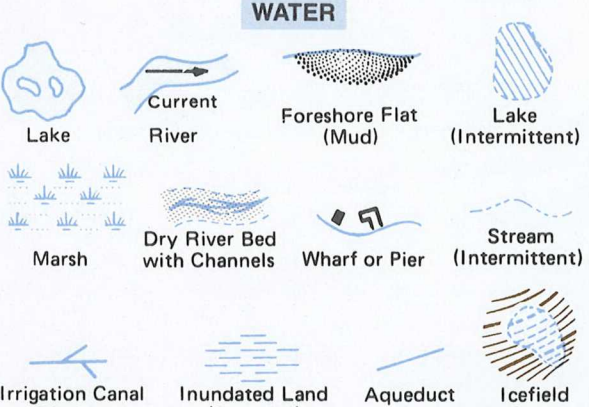
BRIDGES



BOUNDARIES



WATER



VEGETATION

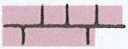
Woods


Scrub


Orchard


Vineyard/
Hop Field

UTILITIES, BUILDINGS, MAN-MADE FEATURES


Built up Area


House, Building

School

Church


Church with
Tower or Spire


Windmill or
Windpump

Cemetery


Historical
Site


Bench
Mark


Spot
Elevation


Tower/
Chimney


Boundary
Marker


Water
Well


Tank


Navigation
Light


Mine or Pit


Power Transmission Line

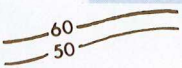

Telephone or Telegraph Line


Pipeline with
Control Valve


Quarry


Sand or Gravel Pit

LAND FEATURES



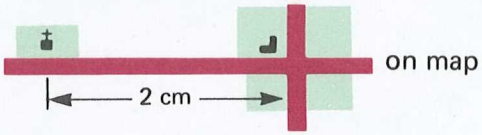
Contours

Depression
Contours

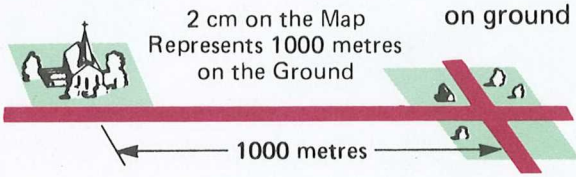

Cliff

Maps are made to Scale

SCALE MEANS THE RATIO OF A DISTANCE ON THE MAP TO THE ACTUAL DISTANCE ON THE GROUND



FOR EXAMPLE:

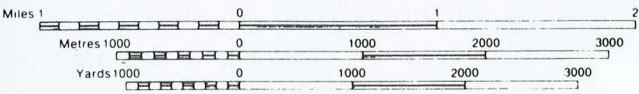


IN THIS CASE
THE SCALE WOULD BE 2cm = 1000m

$$\text{OR} \quad \frac{\text{DISTANCE ON MAP}}{\text{DISTANCE ON GROUND}} = \frac{2\text{cm}}{1000\text{m} \times \frac{100\text{cm}}{\text{m}}}$$

$$\frac{2\text{cm}}{100\,000\text{ cm}} = \frac{1}{50\,000} \quad \text{(approx)}$$

LEARN TO USE SCALE LINES CORRECTLY AND MEASURE DISTANCES ACCURATELY



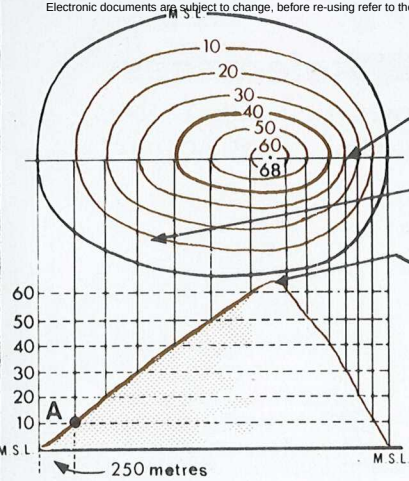
Use the secondary division on the left of Scale Line, for measuring fractional parts as shown below.

In this example the length of the measurement is 2300 metres.

Contour Lines

Contour Lines are drawn through points having the same elevation. They show the height of ground above mean sea level (M.S.L.) in either feet or metres. Check the map margin to determine the unit of measure used on that particular map.

The vertical distance between contour lines is called the Vertical Interval (V.I.) or Contour Interval (C.I.). The horizontal distance between contours is called the Horizontal Equivalent (H.E.) and is measured from the map using the scale lines.



Gradient is the slope of the ground expressed as a fraction. To determine the gradient both V.I. and H.E. must be known and both must be in the SAME UNIT of measure.

GRADIENT = A SLOPE EXPRESSED AS A FRACTION = $\frac{\text{V.I.}}{\text{H.E.}}$

EXAMPLE – GRADIENT of point A in diagram = $\frac{\text{VI 10 metres}}{\text{HE 250 metres}} = \frac{1}{25}$

The slope is said to be 1 in 25. When contour intervals are measured in feet, an Elevation Conversion Scale will be found in the map margin to convert to metres.

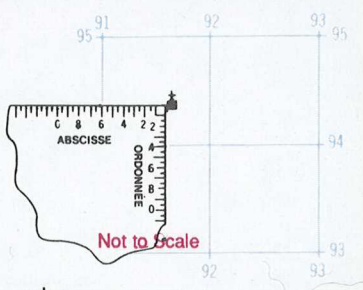
SCALE 1:25 000 or 1:250 000

Grid References

A SOLDIER MUST READ GRID REFERENCES QUICKLY AND ACCURATELY

If you use a romer use it this way:

Read easting first then read northing.



To find Grid reference of ✝ proceed as follows:

1. Find Number of Grid Line West of ✝ (91)
   Ascertain number of tenths ✝ is East of (91)
   This is observed to be 6.
   Set it down thus, 916. This is known as EASTING.
2. Find Number of Grid Line South of ✝ (94)
   Ascertain number of tenths ✝ is North of (94)
   This observed to be 4.
   Set it down thus, 944. This is known as NORTHING.

The Grid reference of ✝ is therefore 916944.

ALWAYS MEASURE OVER TO THE EAST AND THEN UP TO THE NORTH. IN OTHER WORDS FIND THE EASTING AND THEN THE NORTHING.

To avoid ambiguity when giving a grid reference, the alphabetical characters of the 100 000 metre square should be used as a prefix, eg, EV916944.

USE THESE ROMERS

SCALE 1:50 000

A Map is Set

WHEN IT IS MADE TO CORRESPOND WITH THE GROUND IT REPRESENTS

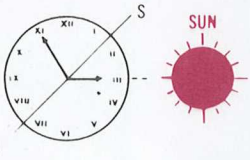
NORTH IS ALWAYS AT THE TOP OF THE MAP

A map may be set by setting the North point or by inspection.

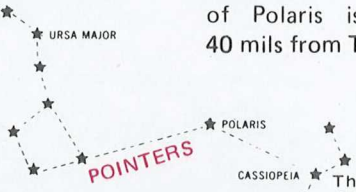
SETTING THE NORTH

By COMPASS – Ensure magnetic declination is set on compass. Place compass on map with compass meridian lines parallel to grid lines and orienting arrow pointing to top of map. Rotate map until magnetic needle lines up with orienting arrow. Map is now set.

By WATCH AND SUN – For Northern Hemisphere If summer time is in effect first set watch back on Standard Time. Place watch flat with hour hand pointing to the SUN. True South is midway between the hour hand and XII. True North is directly opposite. This method is very rough.

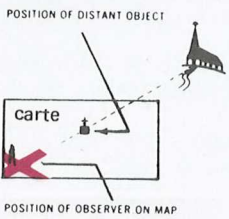


By THE STARS – In latitudes below 60°N the bearing of Polaris is never more than 40 mils from True North.



These constellations revolve anti-clockwise around the Pole.

SETTING BY INSPECTION

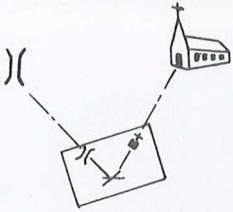


— When the observer knows his position on the map and can identify the position of some distant object, he turns the map so that it corresponds with the ground.

Finding Your Position

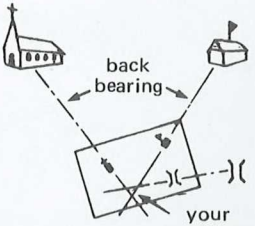
FROM LOCAL DETAIL

Select two objects as close to you as possible and at right angle if possible. Note direction of each point. Where imaginary lines intersect is your location.



FROM RESECTION

Select three distant objects that are identifiable both on map and ground. Take bearing of each in succession and plot BACK BEARING on the map. Your position is within the triangle formed by the intersection of the three lines.



Locating Visible Ground Objects on a Map

Take up a position which you can identify on the map. Take a bearing of the ground object and plot the bearing on the map. The object will lie on this line.

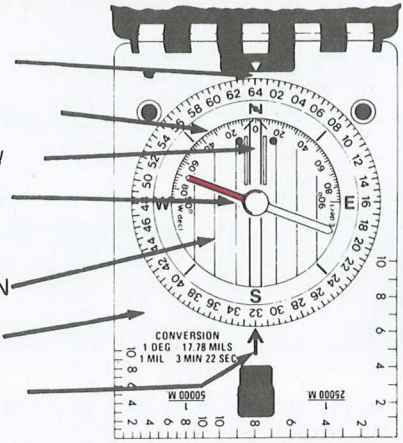
Locating a Map Position on the Ground

Draw on the map the line of bearing from your position to the object by using your compass as a protractor. Ensure the sighting arrow points to the object. Rotate the dial so the meridian lines are parallel to the easting grid lines. The bearing of the object is read at the index pointer. Rotate compass so magnetic needle is lined up with orienting arrow. The object lies on this bearing.

Metric System

10 Millimetres	=1 Centimetre	1 Millimetre	=	.039 In
10 Centimetres	=1 Decimetre	1 Centimetre	=	.394 In
10 Decimetres	=1 Metre	1 Decimetre	=	3.937 In
1000 Metres	=1 Kilometre	1 Metre	=	39.37 In
1 Kilometre	=1 093,633 Yds	8 Kilometres	=	5 Miles (Approx)

The Compass



Route Card

Can you make and use a route card?
A great help to mechanized troops

SPECIMEN ROUTE CARD

FROM 514310 T RD TO 717418 PLAITFORD (WOODS)
REF. SHEET 131 1/50,000 K.P.H. 30

GEN DRCTN	Distance (KM)	TIME	GRID REFERENCES	DIRECTIONS	DIAGRAMS
N.E	5.0	0810	551328	BRIDGE Over R R Left Fork	
	2.5	0805	524327	TURN RIGHT	
	0	0800	514310	S P	

READ ROUTE CARD FROM BOTTOM UP